CLAIMS

What is claimed is:

1. A replication-competent adenovirus vector comprising first and second genes co-transcribed as a single mRNA wherein the first and the second genes are under transcriptional control of a heterologous, target cell-specific transcriptional regulatory element (TRE), wherein the second gene has a mutation in or deletion of its endogenous promoter and is under translational control of an internal ribosome entry site (IRES) and wherein said vector exhibits greater specificity for the target cell than an adenovirus vector comprising a target cell-specific TRE operably linked to a gene and lacking an IRES.

2. The vector of Claim 1, wherein at least one of said first and second genes is an adenovirus gene.

3. The vector of Claim 2, wherein both of said first and said second genes are adenovirus genes.

4. The vector of Claim 2, wherein at least one of said first and said second adenovirus gene is essential for viral replication.

5. The vector of Claim 4, wherein the adenovirus gene essential for viral-replication is an adenovirus early gene.

6. The vector of Claim 5, wherein the adenovirus early gene includes E1A, E1B, E2, or E4.

7. The vector of Claim 4, wherein the adenovirus gene essential for viral replication is an adenovirus late gene.

8. The vector of Claim 3, wherein both said first and said second adenovirus genes are essential for viral replication.

9. The vector of Claim 8, wherein at least one of said first and said second adenovirus genes is an adenovirus early gene.

10. The vector of Claim 8, wherein at least one of said first and said second adenovirus genes is an adenovirus late gene.

11. The vector of Claim 8, wherein said first adenovirus gene is E1A and said second adenovirus gene is E1B.

12. The vector of Claim 11 wherein E1A has its endogenous promoter deleted.

13. The vector of Claim 11 wherein E1A has an inactivation of E1A enhancer I .

14. The vector of Claim 11 wherein E1B has an inactivation of its endogenous promoter.

15. The vector of Claim 11 wherein E1B has a deletion of the 19-kDa region.

16. The vector of Claim 11 wherein E1A has an inactivation of its endogenous promoter and E1B has an inactivation of its endogenous promoter.

17. The vector of Claim 16 wherein E1B has a deletion of the 19-kDa region.

18. The vector of Claim 16 wherein E1A has an inactivation of E1A enhancer I.

19. The vector of Claim 1, wherein the internal ribosome entry site (IRES) is from EMCV.

20. The vector of Claim 1 wherein the IRES is from VEGF.

21. The vector of Claim 1 wherein the IRES includes the 5'UTR of HCV; the 5' UTR of BiP; or the 5'UTR of PDGF.

22. The vector of Claim 1, wherein the TRE is specific for a target cell that is a cancer cell.

23. The vector of Claim 22 wherein the cancer cell includes a prostate cancer cell, a breast cancer cell, a hepatoma cell, a melanoma cell, a bladder cell or a colon cancer cell.

24. The vector of Claim 22, wherein the TRE includes the probasin (PB) TRE, the prostate-specific antigen (PSA) TRE, the mucin (*MUC1*) TRE, the α-fetoprotein (AFP) TRE, the *hKLK2* TRE, the tyrosinase TRE, the human uroplakin II (hUPII) TRE or the carcinoembryonic antigen (CEA) TRE.

25. The vector of Claim 9 wherein said first adenovirus gene has a deletion of its endogenous promoter.

26. The vector of Claim 25 wherein said first adenovirus gene is E1A.

27. The vector of Claim 9 wherein said first and/or said second adenovirus gene has a deletion of an enhancer region.

28. The vector of Claim 27 wherein said first gene is E1A and said enhancer is E1A enhancer I.

29. The vector of Claim 1 wherein said TRE has an endogenous silencer element deleted.

30. The vector of Claim 1 wherein said adenovirus vector comprises an E3 region.

31. The adenovirus vector of Claim 11 wherein said adenovirus comprises an E3 region.

32. The adenovirus vector of Claim 11 further comprising a transgene.

33. An adenovirus vector comprising a gene under transcriptional control of a melanocyte-specific TRE.

34. The vector of Claim 33 wherein said gene is an adenoviral gene.

35. The vector of Claim 34 wherein said adenoviral gene is a gene essential for replication.

36. The vector of Claim 32 wherein said transgene is co-transcribed with said first and said second gene and said transgene is under the translation control of a separate internal ribosome entry site (IRES).

37. The vector of Claim 36 wherein said IRES is from EMCV.

38. The vector of Claim 36 wherein said IRES is from VEGF.

39. The vector of Claim 30 further comprising an adenovirus death protein gene (ADP).

40. The vector of Claim 32 wherein said transgene is a cytotoxic gene.

41. The vector of Claim 1 wherein said first adenovirus gene is essential for viral replication and said second adenovirus gene is the adenovirus death protein gene (ADP).

42. The vector of Claim 41 wherein said first adenovirus gene is E1A.

43. The vector of Claim 42 wherein E1A has a deletion of its endogenous promoter.

44. The vector of Claim 42 wherein said E1A has a deletion of E1A enhancer I.

45. The vector of Claim 1 wherein said first gene is essential for viral replication and said second gene is E3.

46. The vector of Claim 45 wherein said first gene is E1A.

47. A composition comprising a vector according to Claim 1.

48. The composition of Claim 47 further comprising a pharmaceutically acceptable excipient.

49. A composition comprising a vector according to Claim 30.

50. The composition of Claim 49 further comprising a pharmaceutically acceptable excipient.

51. A host cell comprising the vector of Claim 1.

52. A host cell comprising the vector of Claim 30.

53. An adenovirus vector comprising E1B under transcriptional control of a heterologous, target cell specific TRE, wherein E1B has a deletion of part or all of the 19-kDa region.

54. A host cell comprising the adenovirus vector of claim 53.

55. A method for propagating a replication-competent adenovirus vector comprising a target cell-specific TRE, said method comprising combining an adenovirus vector of Claim 1 with mammalian cells that permit the function of a

target cell-specific TRE, such that the adenovirus vector enters the cell, whereby said adenovirus vector is propagated.

56. A method for conferring selective cytotoxicity in target cells, comprising contacting the cells with an adenovirus vector of Claim 41 whereby the vector enters the cell.

57. A method for modifying the genotype of a target cell, comprising contacting the cell with an adenovirus vector of Claim 1, wherein the vector enters the cell.

58. A method for suppressing tumor cell growth, comprising contacting a tumor cell with an adenovirus vector of Claim 41 such that the adenovirus vector enters the tumor cell and exhibits selective cytotoxicity for the tumor cell.